

JEFX 02 was a great success in spiral developing future warfighting processes, technologies, and concepts for the Air Force. Examples include:

- MAAP Toolkit which automated one of the last manual processes in the CAOC, reducing time for the warfighter to build a Master Air Attack Plan by 30%. Success-fully fielded at PSAB and AI Udeid CAOCs within six months of the experiment

- Collaborative Tool advancement. These tools have been a focus and by-product of every experiment since '98, greatly enabling reachback and distributive operations. Pioneered many of the concepts now being furthered by the Standing Joint Force Headquarters

- Collaborative tools also enabled the CAOC to significantly reduce air and space planning timelines and enhanced execution of the Air Tasking Order (ATO). A great success story, not only for JEFX, but for OEF/OIF

- Combat Rescue 2007 improved efficiency and effectiveness of Combat Search and Rescue (CSAR) using a TCT focus and process for rapid solution in a dynamic CSAR situation. Combat Survivor Evader Locator and Global Personnel Recovery System equipment portions of this initiative enabled the first rescue with no direct voice contact with the survivor. Provided a 400% accuracy increase in survivor location and reduced the tasking process to less than an hour, exponentially improving survivors' chance of recovery
- Refined Weapons System Video process to allow handling of non-traditional sensor products used in CAOCs for targeting and assessments

- Special Operations Forces/Blue Force Tracking (SOF/BFT) demonstrated near-real-time secure reporting of SOF ground team and aircraft positions to C2 nodes. The benefits include reliable combat identification, enhanced Common Operational Picture, constant location for SOF, personnel recovery and CSAR and other air and ground units, and improved collaboration and situational

- Paul Revere (PR), a 707 experimental platform, proved to be the epitome of "Blue-collar systems engineering" and a model of spiral development success. PR served as a concept demonstrator and "risk-reduction tool" for the Air Force to jumpstart exploration of key airborne Battle Management, C2 and Information Systems areas

As a senior mentor, I have participated in four USAF large-scale experiments...In that time, we have: completed the baseline development and fielding of our new command and control system, Theater Battler Management Core Systems (TBMCS); refined the concept of operations and processes for Time Sensitive Targeting (TST); pioneered distributed air operations center concepts, as well as reach-back to limit forward footprint for our command centers; demonstrated that mobile, airborne planning and execution suites for deploying battle commanders are not only technically possible, but operationally valuable; proved the worth of collaborative tools for planning and execution; and validated the concept of empowering developers, program managers and users working in unison for common objectives.

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The Air Force Experimentation Office is committed to a vigorous experimentation program to fuel innovation and transformation.



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Air Force Experimentation Office



**AF Experimentation ...
a catalyst for transformation**

Innovation, Experimentation & Transformation- An Air Force Legacy

The Air Force has a rich heritage of innovation, experimentation and transformation. That legacy continues as the Air Force Experimentation Office seeks to identify, analyze, assess, and make recommendations for the fielding of critical near-term as well as mid-term capabilities through its Advanced Process Technology Experiments (APTXs), smaller-scale experiments used as risk-reduction events, and Joint Expeditionary Force Experiments (JEFXs), the Air Force's premier large-scale experiment.

Background

Joint Expeditionary Force Experiment (JEFX) is a Chief of Staff of the Air Force (CSAF)-sponsored, Major Command-executed series of experiments that combines live, constructive and virtual play, joint forces, and technology insertion into a near-seamless warfighting environment.

In the Report of the National Defense Panel in Dec 1997, executing a transformation strategy for the US military should accord the highest priority, and that that process must foster innovation.

We must prepare now for tomorrow's uncertain future ... key is the need to foster innovation in new operational concepts, capabilities, technologies and organizational structures ...

National Security Strategy 1997

As part of a broader effort to exploit the revolution in Military Affairs (RMA), and to meet the Congressional mandate, the Secretary of Defense chartered each of the Services to conduct experimentation within their core competencies.

To meet this challenge, EFX 98 was conducted as the first warfighter experiment to demonstrate emerging Air Force capabilities to deploy and employ decisive Air & Space power for the Joint Force Commander through a Rapid Response Air Expeditionary Force (RAEF).

The Air Force Experimentation Office (AFEO) was established on January 1, 1999. One of the key elements of AFEO's mission is to continue maturing and refining its processes, linking exploration through experimentation to accelerate transition of critical warfighting capabilities.

Why Experiment?

Air Force experimentation is a discovery process that facilitates achieving the Air Force vision by identifying evolutionary and revolutionary improvements in military capabilities to provide the warfighter and National Command Authority with a full range of options in facing future challenges.

Air Force experimentation today supports near-term need or deficiency corrections in support of validated Air Force requirements and recent military operations, and the Combatant Commanders' Integrated Priority List; mid-term capability exploration in support of Joint and Air Force visions; and long-term concept development in association with the Revolution in Military Affairs.

Through innovation processes the Air Force is able to assess and rapidly field the best capabilities to the warfighter while also improving the associated doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF).

Air Force experiments are not designed in the classical, scientific, or statistical sense. These experiments are too complex to boil down to the investigation of one or two variables that can be evaluated to accept or reject a hypothesis, but rather address in a more qualitative versus quantitative manner. The outcome of experiments is knowledge about systems, technology and processes; spiral development of immature technology and processes.

Air Force experimentation is conducted through spiral development. The goal of spiral development is to allow innovation in technology and operational concepts to occur simultaneously and continuously at many levels and across all functional lines. The result is operational requirements evolve in parallel with system capabilities through an iterative process of idea generation, rapid prototyping, technology insertion, and operational testing. Unlike an exercise, failure is acceptable—in fact, just as much is learned from failure as from success.

Experimentation results illuminate and underpin corporate Air Force modernization decisions. The Air Force experimentation effort also leverages unified command, Joint, DoD, agency, coalition, and private sector experimentation and exercise programs.

Why JEFX?

JEFX is a highly focused experiment designed to validate capabilities that produce desired effects in the battlespace.

JEFX is a multi-dimensional experiment, designed to explore an end-to-end process in a large-scale, networked environment, with Command and Control (C2) nodes in a realistic operational environment. It combines live, virtual, and constructive simulation and brings warfighters into a controlled, but operationally realistic environment.

JEFX also performs multi-functional exploration in the areas of space, information management, combat forces, mobility, combat support, and command and control.

This event brings warfighters, along with planners, operational and system architects and engineers, industry representatives and assessors together in order to examine selected initiatives and explore their warfighting utility.

It also allows the warfighter the opportunity to work with and comment on emerging systems, concepts, tactics, techniques and procedures and provide recommendations to Air Force leadership for making sound implementing or fielding decisions.

JEFX Successes:

- Through the JEFX construct, the concepts of Distributed Ops and Reachback were explored
- The acceleration of 27 of the 70 systems used in the CAOC

- Shortened development times and reduced development costs by jump-starting systems such as TBMCs, collaborative tools, and communication improvements (e.g. Gigabit Ethernet LAN that increased bandwidth 10 times in operational CAOCs)

- Took first step in developing network-centric capabilities. Datalink advances with systems such as Combat Track II, JTIDS/SADL, Rapid Precision Targeting System and others greatly advanced execution of Time Sensitive Targeting used in OIF

- Explored new and better procedures to integrate Agile Combat Support functions into expeditionary operations including the Joint Weather Impacts System and Joint Warning and Reporting Network